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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,159	08/01/2003	Munenori Oizumi	TI-34626	5416
23494	7590	06/25/2007	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED			ROSARIO, DENNIS	
P O BOX 655474, M/S 3999				
DALLAS, TX 75265			ART UNIT	PAPER NUMBER
			2624	
			NOTIFICATION DATE	DELIVERY MODE
			06/25/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/633,159	OIZUMI ET AL.	
	Examiner	Art Unit	
	Dennis Rosario	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 30 April 2007.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-5 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-5 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 01 August 2003 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application
- 6) Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment was received on 4/30/07. Claims 1-5 are pending.

Claim Objections

2. Claim 4 is objected to because of the following informalities:

Claim 4, line 4 : "x-direction" ought to be amended to "y-direction".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-5 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Note that the applicant has identified interpolation to be an equation on page 7, line 7. However the specification does not disclose that the equation is interpolation. Would of ordinary in the art of image processing conclude that the equation on page 7, line 7 is interpolation or filtering or are equivalent? The specification appears to describe the equation as a filter. Note that the specification does disclose interpolation on pages 1 and 3, but there appears to be no explicit connection of the interpolation to the equation on page 7, line 7 of the specification.

Response to Arguments

5. Applicant's arguments on page 4, filed 4/30/07 have been fully considered but they are not persuasive and states:

“Tai does not suggest the interpolating of claim 1, step (c).”

Regardless if Tai suggests interpolation, the claimed interpolation and associated equation as pointed out by the applicants were not adequately described in the specification as being interpolation and instead the equation was described as being a filter and not interpolation. Thus, applicant's arguments are not convincing.

6. Applicant's arguments on page 4, filed 4/30/07 have been fully considered but they are not persuasive and states:

“Tults does not suggest the interpolating of claim 1, step (c).”

Regardless if Tults suggests interpolation, the claimed interpolation and associated equation as pointed out by the applicants was not adequately described in the specification as being interpolation and instead the equation was described as being a filter and not interpolation. Thus, applicant's arguments are not convincing.

7. Applicant's arguments on page 5, filed 4/30/07 have been fully considered but they are not persuasive and states:

"Adams does not suggest the interpolating of claim 1, step (c)."

Regardless if Adams suggests interpolation, the claimed interpolation and associated equation as pointed out by the applicants was not adequately described in the specification as being interpolation and instead the equation was described as being a filter and not interpolation. Thus, applicant's arguments are not convincing.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1,2 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Tai (US Patent 5,054,100 A1).

Regarding claim 1, Tai discloses a method of image filtering, comprising:

- (a) computing edge intensity and direction for each pixel in an image (fig. 7,num. 34);
- (b) filtering said image with a filter which, for each pixel, smoothes in a direction parallel to the edge found in step (a) for said each pixel (fig. 5: limitations (a) and (b) are well known as edge sharpening to one of ordinary skill in the art of edge filtering);
- (c) interpolating said image and said filtered image from step (b) wherein said interpolating at said each pixel depends upon said intensity found in step (a) (limitation (c) is not given patentable weight: see paragraph 4, above).

Regarding claim 2, Tai discloses the method of claim 1, wherein:

- (a) said computing step (a) of claim 1 includes:
 - (i) computing variations in pixel values for horizontal, vertical, and diagonals at said each pixel (fig. 7,num. 34); and
 - (ii) computing edge direction and intensity from said variations of (i)(fig. 7,num. 36).

Regarding claim 4, Tai discloses the method of claim 1, wherein:

(a) said filter of step (b) of claim 1 for said each pixel is a matrix (as shown in fig. 2) which depends upon $r=d_x/d_y$ (the structural relationship of the formula is not given patentable weight and will be interpreted as an equation as disclosed as equation (4) in column 5 with variables) with d_x (or " x_0 " in equation (4)) is a measure of variation in the x-direction at said each pixel and d_y (or " y_0 " in equation (4)) is a measure of variation in the x-direction at said each pixel.

10. Claims 1 and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Tults (US Patent 6,339,451 B1).

Regarding claim 1, Tults discloses a method of image filtering, comprising:

- (a) computing edge intensity (as indicated in fig. 3) and direction (as indicated in figures 6a-6d) for each pixel in an image;
- (b) filtering (via fig. 7,um. 112) said image with a filter which, for each pixel, smoothes (as shown in figure 2,num. 6 relative to fig. 1,num. 2) in a direction parallel to the edge found in step (a) for said each pixel;
- (c) interpolating said image and said filtered image from step (b) wherein said interpolating at said each pixel depends upon said intensity found in step (a) (limitation (c) is not given patentable weight: see paragraph 4, above).

Regarding claim 5, Tults discloses the method of claim 1, wherein:

- (a) said image is a color channel (or "color signals R,G and B" in col. 8, line 55) of a color image.

Art Unit: 2624

11. Claims 1 and 3 are rejected under 35 U.S.C. 102(e) as being anticipated by Adams (US Patent 7,023,487 B1).

Regarding claim 1, Adams discloses a method of image filtering, comprising:

- (a) computing edge intensity and direction for each pixel in an image (as indicated in fig. 2A, numerals 42 and 44);
- (b) filtering said image with a filter (as indicated in fig. 2B as "HighPass Filter Direction) which, for each pixel, smoothes in a direction parallel (as indicated by the plurality of arrows in fig. 3A, num. 58) to the edge found in step (a) for said each pixel;
- (c) interpolating said image and said filtered image from step (b) wherein said interpolating at said each pixel depends upon said intensity found in step (a) (limitation (c) is not given patentable weight: see paragraph 4, above).

Regarding claim 3, Adams discloses the method of claim 1, wherein:

- (a) said filter of step (b) of claim 1 for said each pixel is a rotation (indicated in fig. 2A as num. 44) according to said edge direction of step (a) of claim 1 of a fixed filter.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bradley et al. (US Patent 6,928,196 B1) is pertinent as teaching a method of detecting edges and smoothing and interpolation as shown in fig. 1.

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario whose telephone number is (571) 272-7397. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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